

REMARKS

The following remarks are offered in complete response to the Office Action dated December 18, 2008. In light of these remarks and the foregoing amendments, reexamination and reconsideration are respectfully requested.

Claims 1-12 and 17-31 are present in this application. Claim 16 has been canceled in this amendment. Claims 13-15 were previously cancelled.

Claim 1 has been amended to: (1) replace "hydrogen" with "hydrogeno" to have consistent wording between the claims and the specification; (2) properly identify the groups in the definition of R^c , and (3) recite that the hydrophobic silica is not present as dried hydrophobic silica during said method. Support for the hydrophobic silica not being present as dried hydrophobic silica during the method is found in cancelled claim 16 and in the specification at least on page 20, lines 3-4. Claim 10 has been amended to: (1) recite the silicone material comprises at least one oligoorganosiloxane, (2) replace "the stirred vessel" with "a stirred vessel", (3) clarify the materials added to the vessel in step a) by providing numerical designations, and (4) recite that the hydrophobic silica is not present as dried hydrophobic silica during said method. Support for the hydrophobic silica not being present as dried hydrophobic silica during the method is found in cancelled claim 16 and in the specification at least on page 20, lines 3-4. No new matter has been added in making these amendments

Double Patenting

Claims 1, 3, 5-7, 20 and 21 have been provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over co-pending Application No. 10/541,139, published in U.S. Patent Application Publication 2006/0241222 on October 26, 2006.

Applicants request that this matter be held in abeyance until such time as one of the applications is otherwise allowable. It is believed to be premature to file a terminal disclaimer before the scope of the claims has been settled. In the event that the Examiner is ready to allow this application except for this rejection, he is asked to contact the undersigned so that an appropriate terminal disclaimer can be promptly prepared and filed.

Specification

The specification has been objected to for the following reasons:

1. The use of the trademark Irgafos® on page 4, line 15 of the specification has been noted.

The specification has been amended to capitalize the trademark and to provide the generic terminology for this compound.

2. Page 31, line 13 recited $(\text{CH}_3)\text{SiCl}$, which is not a correct chemical formula. The formula was amended to recite $(\text{CH}_3)_3\text{SiCl}$.

3. Page 31, lines 23-24 recited dialkylhydrogenohalomonosilanes, and provided the example $(\text{CH}_3)_2\text{SiCl}_2$. This formula was amended to recite $(\text{CH}_3)_2\text{SiHCl}$.

4. The definition of formula (3), on page 41, lines 25-26 has been amended to correct a typographical error in the definition of R^3 , on page 42, line 1, which

previously was recited as R. Support for this amendment is found in the French priority document. The formula was also amended to recite the definition of "a" in formula (3). The symbol "a" represents an integer with a value from 0 to 4, inclusive. Support for this is found in the general understanding of chemistry, where silicon has a valence of 4

Claim Objections

Claims 1-9, 12 and 16-28 were objected to because claim 1 recited that $R^c =$ hydrogen, ... while the specification recited $R^c =$ hydrogeno, The Office Action states that "though hydrogeno and hydrogen are synonyms that are used interchangeably in the art, for consistency purposes, a radical should be identified by the same term throughout the disclosure."

Claim 1 has been amended to replace "hydrogen" with "hydrogeno" in the definition of R^c . Applicants therefore request that the objection to claim 1 be withdrawn.

Claims 2-9, 12 and 16-28 were objected to for depending from a claim that was objected to. Claim 1 has been amended to overcome the rejection. Applicants therefore request that the objection to claims 2-9, 12 and 16-28 be withdrawn.

35 U.S.C. §102(b) prior art rejections

Claims 1, 3, 5-9, 12, 16, 18, 19 and 21-30 have been rejected under 35 U.S.C. §102(b) as being anticipated by Burns et al. (US 6,184,408).

It is well established that in order to demonstrate anticipation over 35 U.S.C. § 102(b), each feature of the claim at issue must be found, either expressly

described or under principles of inherency, in a single prior art reference. See, *Kalman v. Kimberly-Clark Corp.*, 218 USPQ 789 (Fed. Cir. 1983).

Burns discloses a method of preparing a hydrophobic precipitated silica by contacting a hydrophilic precipitated silica with (1) a catalytic amount of an acid and (2) an organosilicon compound selected from organosilanes, organosiloxanes and organodisilazanes, where each of these groups of compounds have a specific structure, and (3) a water-miscible organic solvent in an amount sufficient to facilitate reaction of the hydrophilic precipitated silica with the organosilicon compound to form the hydrophobic precipitated silica. (col. 2, lines 25-43 and col. 2, line 57 - col. 3, line 7) The specification teaches that:

The present method requires the presence of a water-miscible organic solvent in an amount sufficient to facilitate the hydrophobing of the hydrophilic precipitated silica with the organosilicon compound. (col. 4, lines 63-66) (Emphasis added)

The specification teaches that:

In the present method after formation of the hydrophobic precipitated silica it may be desirable to add a water-immiscible organic solvent to the resulting aqueous suspension to effect separation of the hydrophobic precipitated silica from the aqueous suspension. (col. 6, lines 30-34) (Emphasis added)

The specification further teaches that the water-immiscible organic solvent is later removed from the hydrophobic precipitated silica.

The amount of water-immiscible organic solvent added to the present method should provide a solvent to silica weight ratio greater than about 0.05:1. Preferred is a solvent to silica weight ratio within a range of about 0.1:1 to 10:1. Most preferred is a solvent to silica weight ratio within a range of about 1:1 to 5:1. The upper limit for the amount of water-immiscible solvent added to the method is limited only by

economic considerations such as solvent cost, solvent recovery or disposal expense, and equipment capacity.

It is preferred that the water-immiscible organic solvent have a boiling point below about 250.degree. C. to facilitate its removal from the hydrophobic precipitated silica. However, the boiling point of the water-immiscible organic solvent is not critical since the solvent may be removed from the hydrophobic silica by filtration, centrifuging, or other suitable means.

The hydrophobic precipitated silica formed by the present method may be used as an aqueous suspension or slurry, may be recovered by such techniques as filtration or centrifugation with or without the addition of water immiscible organic solvent to facilitate recovery, may be further washed to reduce contaminants, and may be dried prior to use. (col. 6, line 55 - col. 7, line 9)

Each of the examples in Burns the water-immiscible solvent was removed from the slurry of the hydrophobic precipitated silica by evaporation and the resulting hydrophobic precipitated silica was further dried at various elevated temperatures for various periods of time.

Claim 1 of the instant application requires three features not disclosed in Burns. Step c) in Claim 1 of the instant application requires producing a modified hydrophobic silica filler by grafting hydrophobic units formed by $\equiv\text{Si}-(\text{R}^{\text{C}})_{1 \text{ to } 3}$, onto the silica by exposing the silica to halosilanes that are precursors of these units and by allowing the reaction to proceed; wherein the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase. (Emphasis added) Burns requires producing the hydrophobic silica from a hydrophilic silica using a water-miscible organic solvent in an amount sufficient to facilitate the hydrophobing of the hydrophilic precipitated silica with the organosilicon compound, as discussed

above. By requiring a water-miscible organic solvent, Burns does not disclose the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase, as required by Claim 1 of the instant application.

Step i) of Claim 1 of the instant application requires recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material. Burn does not teach recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material and does not disclose a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material. Burns discloses that excess organosilicon compound added to form the hydrophobic silica can be removed by distillation, washing with solvent, or other known techniques. (col. 6, lines 27-29) In addition, Burns teaches:

The hydrophobic precipitated silica formed by the present method may be used as an aqueous suspension or slurry, may be recovered by such techniques as filtration or centrifugation with or without the addition of water immiscible organic solvent to facilitate recovery, may be further washed to reduce contaminates, and may be dried prior to use. (col. 7, lines 3-9)

However, Burns does not teach recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material, as required by step i) in claim 1 of the instant application.

Claim 1 of the instant application also requires that the hydrophobic silica is not present as dried hydrophobic silica during said method. As shown above, Burns teaches removal of solvents and excess organosilicon compound added to form the hydrophobic silica, and forming a dried hydrophobic precipitated silica. In addition,

each of the examples in Burns removed solvent from the hydrophobic precipitated silica and further dried the isolated hydrophobic precipitated silica. Therefore Burns does not disclose that the hydrophobic silica is not present as dried hydrophobic silica during said method, as required by claim 1 of the instant application.

Therefore Burns does not disclose each element required in claim 1 of the instant application.

Claims 3, 5-9, 12, 18, 19 and 21-28 have also been rejected under 35 U.S.C. §102(b) as being anticipated by Burns. However each of these claims depend from claim 1. Since Claim 1 is not anticipated by Burns, and each of these claims depend from claim 1, Applicants request the withdrawal of the rejections of claims 1, 3, 5-9, 12, 18, 19 and 21-28 as being anticipated by Burns.

With regard to claims 29 and 30, which have also been rejected as being anticipated by Burns, claims 29 and 30 depend from claims 10 and 11, respectively, and claim 11 depends from claim 10. Claim 10 was not rejected as being anticipated by Burns. Therefore claims 29 and 30, which depend from claim 10, cannot be anticipated by Burns. In addition, Claim 10, like claim 1, requires three elements not disclose by Burns:

1. Step a), material (3) part of the silicone material (SM) comprising at least one oligoorganosiloxane;
2. recovering an oily suspension of hydrophobic particulate silicic filler in a crosslinkable silicone material *SM*; and
3. the hydrophobic silica is not present as dried hydrophobic silica during said method.

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of about 0.1:1 to 10:1. Most preferred is a solvent to silica weight ratio within a range of about 1:1 to 5:1. The upper limit for the amount of water-immiscible solvent added to the method is limited only by economic considerations such as solvent cost, solvent recovery or disposal expense, and equipment capacity.

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Each of the examples in Burns the water-immiscible solvent was removed from the slurry of the hydrophobic precipitated silica by evaporation and the resulting hydrophobic precipitated silica was further dried at various elevated temperatures for various periods of time.

Claim 1 of the instant application requires three features not disclosed in Burns. Step c) in Claim 1 of the instant application requires producing a modified hydrophobic silica filler by grafting hydrophobic units formed by $\equiv\text{Si}-(\text{R}^c)_{1 \text{ to } 3}$, onto the silica by exposing the silica to halosilanes that are precursors of these units and by allowing the reaction to proceed; wherein the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase. (Emphasis added) Burns requires producing the hydrophobic silica from a hydrophilic silica using a water-miscible organic solvent in an amount sufficient to facilitate the hydrophobing

of the hydrophilic precipitated silica with the organosilicon compound, as discussed above. By requiring a water-miscible organic solvent, Burns does not disclose the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase, as required by Claim 1 of the instant application.

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Claim 1 of the instant application also requires that the hydrophobic silica is not present as dried hydrophobic silica during said method. As shown above, Burns teaches removal of solvents and excess organosilicon compound added to form the

hydrophobic silica, and forming a dried hydrophobic precipitated silica. In addition, each of the examples in Burns removed solvent from the hydrophobic precipitated silica and further dried the isolated hydrophobic precipitated silica. Therefore Burns does not disclose that the hydrophobic silica is not present as dried hydrophobic silica during said method, as required by claim 1 of the instant application.

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Claims 3, 5-9, 12, 18, 19 and 21-28 have also been rejected under 35 U.S.C. §102(b) as being anticipated by Burns. However each of these claims depend from claim 1. Since Claim 1 is not anticipated by Burns, and each of these claims depend from claim 1, Applicants request the withdrawal of the rejections of claims 1, 3, 5-9, 12, 18, 19 and 21-28 as being anticipated by Burns.

With regard to claims 29 and 30, which have also been rejected as being anticipated by Burns, claims 29 and 30 depend from claims 10 and 11, respectively, and claim 11 depends from claim 10. Claim 10 was not rejected as being anticipated by Burns. Therefore claims 29 and 30, which depend from claim 10, cannot be anticipated by Burns. In addition, Claim 10, like claim 1, requires three elements not disclose by Burns:

1. Step a), material (3) part of the silicone material (SM) comprising at least one oligoorganosiloxane;
2. recovering an oily suspension of hydrophobic particulate silicic filler in a crosslinkable silicone material *SM*; and

3. the hydrophobic silica is not present as dried hydrophobic silica during said method.

It was shown above for claim 1 that these three elements were not present in Burns. Therefore claims 29 and 30 cannot be anticipated by Burns. Applicants therefore request the withdrawal of the rejection of claims 29 and 30 as being anticipated by Burns.

35 U.S.C. §103(a) rejections

Claims 2, 4, 10, 11, 17, 20 and 31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Burns (US 6,184,408)

Applicants respectfully submit that claims 2, 4, 10, 11, 17, 20 and 31 are not obvious over Burns and that these claims are allowable.

To establish a *prima facie* case of obviousness, three basic criteria must be met. (MPEP 2143) First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teachings of Burns have been discussed above.

Claims 2, 4, 17, 20 and 21 depend from claim 1. Claims 11 depends from claim 10, which has also been rejected as being obvious. As shown above, claims 1 and 10 each comprise three elements that are not disclosed in Burns. In the analysis immediately below claims 1 and 20 will be shown to be non-obvious and therefore claims depending from them (claims 2, 4, 11, 17, 20 and 21) would also not

be obvious. Individual rejected dependent claims will also be analyzed, where appropriate, to demonstrate the addition features would not be obvious.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. There is no suggestion or motivation in Burns to:

1. produce a modified hydrophobic silica filler by grafting hydrophobic units formed by $\equiv\text{Si}(\text{R}^c)_{1 \text{ to } 3}$, onto the silica by exposing the silica to halosilanes that are precursors of these units and by allowing the reaction to proceed; wherein the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase, as required in step c) of claim 1 the instant application;
2. recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material, as requires in step i) of Claim 1 of the instant application; and
3. the hydrophobic silica is not present as dried hydrophobic silica during the method.

Nor is there any suggestion or motivation to use each of these three required elements. Therefore, there is no suggestion or motivation, either in the cited reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to obtain the invention of the instant application.

To establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. There is no reasonable expectation of success based on the teachings in Burns to have the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase. Burns requires the use of a water-miscible organic solvent to facilitate the hydrophobing of the hydrophilic precipitated silica with the organosilicon compound. The presence of the halosilane precursors in a nonaqueous phase, as required in the instant application, with a water-miscible organic solvent and an aqueous suspension of hydrophilic precipitated silica, both of which are required by Burns, would not results in a reasonable expectation of success in obtaining the applicants invention. The presence of the water-miscible organic solvent with the halosilane precursors in a nonaqueous phase and an aqueous suspension of hydrophilic precipitated silica would not result in a reasonable expectation of success that the grafted hydrophobic units are transferred from the aqueous phase to the nonaqueous phase because the presence of the water-miscible solvent would be expected to affect such transfer. In addition, depending upon the chemical nature and amounts of the water-miscible solvent used, a non-aqueous phase may not be present, as the mixture of water and the water-miscible solvent may solubilize the material that would have formed the non-aqueous phase. With regard to recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material, there is nothing in Burns that indicates that such an oil could be produced by the claimed process. There is nothing in Burns that indicates that the presence of the cross-linkable silicone material would not react

during the process of Burns. With regard to the hydrophobic silica not being present as dried hydrophobic silica during the method, the teachings and examples in Burns are directed towards isolated hydrophobic silica free of free and organic solvents. There is nothing in Burns that indicates that the hydrophobic silica produced could be used without being separated from all of the components present during the reaction to form the hydrophobic silica. Therefore there is no reasonable expectation of success in producing the applicants' invention based on the teachings in Burns.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. As shown above Burns does not teach or suggest the three elements

1. produce a modified hydrophobic silica filler by grafting hydrophobic units formed by $\equiv\text{Si}-(\text{R}^\circ)_{1 \text{ to } 3}$, onto the silica by exposing the silica to halosilanes that are precursors of these units and by allowing the reaction to proceed; wherein the halosilane precursors are present in a nonaqueous phase and the silica comprising the grafted hydrophobic units is transferred from the aqueous phase to the nonaqueous phase, as required in step c) of claim 1 the instant application;
2. recovering an oil which comprises a hydrophobic particulate filler suspension of the modified hydrophobic silica filler in a crosslinkable silicone material, as requires in step i) of Claim 1 of the instant application; and
3. the hydrophobic silica is not present as dried hydrophobic silica during the method.

Therefore, the prior art references, either alone or combined do not teach or suggest all the claim limitations.

Claims 1 and 10, the independent claims in this application, are therefore not obvious over Burns. Claims 2, 4, 11, 17, 20 and 31, which depend from claims 1 and 10, are therefore also not obvious over Burns.

With regards to claims 4 and 20, Claim 4 requires grafting functional units other than hydrophobic units onto silica. Grafting a phenyl group onto silica results in grafting a hydrophobic unit onto silica. Step c) of claim 1 recites that the hydrophobic units may be aryl groups. The Office Action indicates that Burns teaches the use of methylphenyldichlorosilane. However the use of methylphenyldichlorosilane in the instant invention does not result in grafting functional units other than hydrophobic units onto silica, as required by claim 4 of the instant application. The Office Action admits that "Burns et al. does not teach the method further comprising grafting functional units other than hydrophobic units onto silica by exposing the silica to halosilane precursors of these functional grafts of the instant claims." (page 12, lines 2-4). The Office Action alleges that one of ordinary skill in the art, motivated by the desire to optimize the hydrophobic property of the silica, would have formed various version of the composition in Example 4, including one in which methylphenyldichlorosilane is incorporated into the method by routine experimentation. (page 12, lines 9-13). As shown above, even if a skilled person were to have used methylphenyldichlorosilane to make such a modification, this would not result in the method of claim 4, because this would not graft functional units other than hydrophobic units onto silica, as required by claim 4. Therefore claim 4 is not obvious over Burns.

Claim 20, which depends from claim 4, requires grafting functional units other than hydrophobic units onto silica, where the functional units other than hydrophobic units are selected from the group consisting of the following functions: bactericidal, bacteriostatic, chromophoric, fluorescence, antifouling and combinations thereof. The Office Action indicates that by incorporating the methylphenyldichlorosilane into the method of col. 13, lines 15-53, the phenyl functional unit of the methylphenyldichlorosilane is grafted onto the silica and the phenyl unit of Burns is chromophoric. As shown above, claim 4 is not obvious. Claim 20 is not obvious over Burns for the same reason provided above for claim 4 not being obvious. In addition, since claim 4 is not obvious, claim 20, which depends from claim 4 is also not obvious.

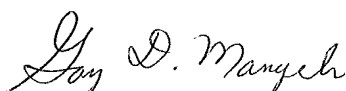
Applicants respectfully submit that Claims 2, 4, 10, 11, 17, 20 and 31 are not obvious over Burns and request that this rejection be withdrawn.

If there are any questions concerning this Response or the application in general, Applicants invite the Examiner to telephone the undersigned at the Examiner's earliest convenience.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: June 18, 2009

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